

**DEPARTMENT OF CONSERVATION**

DIVISION OF ADMINISTRATION

DIVISION OF MINES AND GEOLOGY

DIVISION OF OIL, GAS AND GEOTHERMAL RESOURCES

DIVISION OF RECYCLING



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February 25, 1998

Mr. Gregory Connaughton  
Assistant Public Works Director  
Maintenance Division  
Public Works Department  
2475 Waterbird Way  
Martinez, CA 94553-1457

RE: PARK AVENUE LANDSLIDE, RICHMOND, CONTRA COSTA COUNTY

Dear Mr. Connaughton:

This letter was prepared in response to a request made on February 10, 1998, by Len Miller of the State Office of Emergency Services (OES) for the California Department of Conservation, Division of Mines and Geology (DOC/DMG) to examine a landslide between Park Avenue and McBryde Avenue in Richmond, Contra Costa County (OES Mission #98-CST7204). I visited the site briefly in the evening of February 10 and then met you at the site on the morning of February 11, 1998.

## BACKGROUND

The landslide in question is on Park Avenue approximately 2 miles northeast of central Richmond, in an unincorporated area of Contra Costa County. The slide is a relatively small slump block, about 80 feet wide and extending about 60 feet south from Park Avenue. The slide originates on a vacant private parcel on the south side of Park Avenue and is failing onto the street. Park Avenue is the only public access road to a small neighborhood of approximately 25 homes, although an alternate emergency access is possible via East Bay Regional Parks access roads. Near the landslide, Park Avenue follows the contour of the slope approximately 60 feet above the level of Wildcat Creek. The slide, which originates on the slope above the road, has flowed out onto the road, making access to homes along the road above the slide difficult. Contra Costa County Public Works Department crews have been working to keep the road open, but this has involved removal of material from the toe of the slide, which tends to cause further movement of the existing slide or even enlargement of the slide. My main objectives in examining the slide were to estimate the potential for the slide to expand downslope, involving the road and blocking access to the homes in the canyon and the

potential for the slide to expand upslope, endangering two or three homes on McBryde Avenue above the slide and that street, which is the only access road to another small neighborhood.

According to local residents, this slide began moving on February 3 or 4 and moved up to 4 feet out onto the road in 1 day (possibly Saturday, February 7). Crews from Contra Costa County Public Works Department finished removing mud and debris from the roadway surface on February 10, but the slide may have moved overnight, because slide debris covered up to 2 feet of the roadway surface on the morning of February 11. Pacific Gas and Electric (PG&E) crews had also removed trees from the slide area to prevent damage to power lines.

## GEOLOGIC CONDITIONS

The slide is in an area mapped as underlain by metamorphic rocks of the Franciscan Complex in a thin zone between the Hayward and Wildcat Faults (Bishop and others, 1973). An exposure of bedrock just west of the slide appeared to be Franciscan metamorphic rock, consistent with this mapping. No exposures of rock were observed in the slide mass, but the material exposed in the headscarp, which has the consistency of a stiff soil, may be deeply weathered and altered bedrock. The Hayward Fault is an active fault and probably passes within 100 feet of the west side of the slide (see attached map). This area was not previously mapped as a landslide by Bishop and others (1973) or Nilsen (1975).

The slide moved as a slump block, with the upper part rotating and cracking and the lower part breaking up and flowing onto the road as an earth flow. The road pavement showed no fresh cracks or deformation, indicating that the slide was entirely above the road. The headscarp is sharp, up to about 6 feet high and near vertical in places. No additional cracks were found in the area immediately above the headscarp. The nearest home above the slide is about 30 to 40 feet from the headscarp. It appeared that the slide is a relatively intact block and not rapidly expanding upslope. The upper part of the landslide mass is broken into blocks 2 to 8 feet wide separated by scarps and fissures. Much of the material in this area was saturated and some fissures were filled with water.

## CONCLUSIONS

The landslide on Park Avenue does not seem to be in imminent danger of failing catastrophically. The slide extends from the road upslope, but does not currently endanger the road or any structures. Grading to keep the road open is removing support from the toe of the slide, but the total volume removed so far does not appear to have significantly decreased the stability of the slide. The slide mass is saturated, with standing water in fissures and depressions in the headscarp area and seepage from the toe. Improving the drainage of the slide should increase its stability. Eventual

repair of the slide will involve grading on private property and is not practical during the rainy season. Temporary measures to improve drainage may increase the stability of the slide until more permanent repairs can be made.

## RECOMMENDATIONS

Drainage should be improved to increase the stability of the slide. This could involve minor surface grading of the upper part of the slide so that water runs off, rather than being trapped by fissures in the slide. Covering the head of the slide with plastic sheeting may slow water infiltration into the slide in the very short term (through a storm or two). It may be possible to drill horizontal drains into the slide mass from the road to allow water to escape from the slide mass. The County should have a Certified Engineering Geologist or Geotechnical Engineer examine the slide to determine the best method for increasing its stability through the rainy season and make recommendations regarding repair options.

## REFERENCES

- Bishop, C.C., R.D. Knox, R.H. Chapman, D.A. Rogers, and G.B. Chase, 1973, Geological and geophysical investigations for Tri-Cities seismic safety and environmental resources study: California Division of Mines and Geology Preliminary Report 19, 44p.
- Nilsen, T.H, 1975, Preliminary photo interpretation map of landslide and other surficial deposits of the Richmond 7.5' Quadrangle, Contra Costa and Alameda Counties, California; U.S. Geological Survey Open File Report 75-277-47.

Chris Wills CEG 1423  
Associate Engineering Geologist

Concur

Date Trinda L. Bedrossian CEG 1064  
Supervising Geologist

Attachment: Location map

cc: Len Miller, OES  
James Davis, State Geologist



Location Map showing Park Avenue landslide in relation to Hayward fault and Alquist-Priolo Earthquake fault zone boundaries, from EFZ map of Richmond Quadrangle.